CLN6 gene

ceroid-lipofuscinosis, neuronal 6, late infantile, variant

Normal Function

The *CLN6* gene provides instructions for making a protein whose function is not well understood. Within cells, the CLN6 protein is found in a structure called the endoplasmic reticulum, which is involved in protein processing and transport. Research suggests that the CLN6 protein regulates the transportation of certain proteins and fats from the endoplasmic reticulum to lysosomes. Lysosomes are compartments in the cell that digest and recycle materials. Based on this function, the CLN6 protein appears to help cells get rid of materials they no longer need.

Health Conditions Related to Genetic Changes

CLN6 disease

More than 70 mutations in the *CLN6* gene have been found to cause CLN6 disease. This condition impairs motor and mental development, typically starting in early to late childhood, causing gradually worsening problems with movement and a decline in intellectual function. In some cases, signs and symptoms of CLN6 disease do not appear until adulthood.

Most *CLN6* gene mutations result in the production of an abnormal CLN6 protein that is quickly broken down (degraded). As a result, there is a severe reduction in the amount of functional CLN6 protein in cells. While it is not known how the loss of this protein causes the signs and symptoms of CLN6 disease, it is likely that the protein's quick degradation contributes to the childhood onset of CLN6 disease.

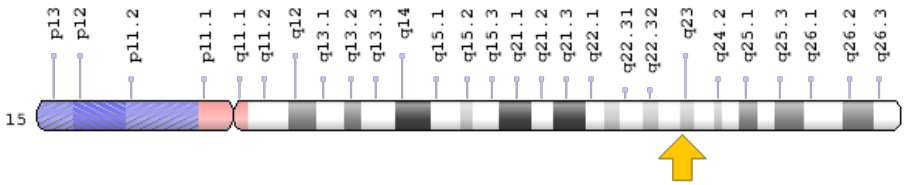
In the cases in which CLN6 disease develops in adulthood, *CLN6* gene mutations often change single protein building blocks (amino acids), resulting in a CLN6 protein with reduced function. Research suggests that these *CLN6* gene mutations allow enough functional protein to be produced so that signs and symptoms of the disorder do not develop until later in life.

CLN6 disease is characterized by the accumulation of proteins or peptides and other substances in lysosomes. These accumulations occur in cells throughout the body; however, nerve cells seem to be particularly vulnerable to their effects. The accumulations can cause cell damage leading to cell death. The progressive death of nerve cells in the brain and other tissues leads to the signs and symptoms of CLN6 disease. However, it is unclear how mutations in the *CLN6* gene are involved in the buildup of substances in lysosomes in CLN6 disease. These accumulations occur in more cells throughout the body in children with CLN6 disease than in affected adults.

Chromosomal Location

Cytogenetic Location: 15q23, which is the long (q) arm of chromosome 15 at position 23

Molecular Location: base pairs 68,206,992 to 68,229,742 on chromosome 15 (Homo sapiens Annotation Release 108, GRCh38.p7) (NCBI)



Credit: Genome Decoration Page/NCBI

Other Names for This Gene

- ceroid-lipofuscinosis neuronal protein 6
- CLN4A
- CLN6_HUMAN
- FLJ20561
- HsT18960
- nclf

Additional Information & Resources

Educational Resources

- Jasper's Basic Mechanisms of the Epilepsies (fourth edition, 2012): Neuronal Ceroid Lipofuscinoses
  https://www.ncbi.nlm.nih.gov/books/NBK98154/#lehesjoki.s8

GeneReviews

- Neuronal Ceroid-Lipofuscinoses
  https://www.ncbi.nlm.nih.gov/books/NBK1428

Scientific Articles on PubMed

- PubMed
  https://www.ncbi.nlm.nih.gov/pubmed?term=%28CLN6%5BTIAB%5D%29+AND+%28%28Genes%5BMH%5D%29+OR+%28Genetic+Phenomena%5BMH%5D%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+3600+days%22%5Bdp%5D

OMIM

- CLN6 GENE
  http://omim.org/entry/606725

Research Resources

- ClinVar
  https://www.ncbi.nlm.nih.gov/clinvar?term=CLN6%5Bgene%5D
- HGNC Gene Symbol Report
  http://www.genenames.org/cgi-bin/gene_symbol_report?q=data/hgnc_data.php&hgnc_id=2077
- NCBI Gene
  https://www.ncbi.nlm.nih.gov/gene/54982
- UniProt
  http://www.uniprot.org/uniprot/Q9NWW5
- University College London: CLN6 Gene Mutation Database
  http://www.ucl.ac.uk/ncl/CLN6mutationtable.htm

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